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THE WEST AFRICAN POCKET BOOK.

FIFTH EDITION.

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THE

WEST AFRICAN POCKET BOOK.

A GUIDE FOR NEWLY-APPOINTED GOVERNMENT OFFICERS

Compiled by direction of the Secretary of State for the Colonies.

FIFTH EDITION.

November, 1920.

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Corrections and suggestions for the improvement of this book will be welcome at any time, and may be sent direct to the Colonial Office. It is hoped that Officers of local experience will fully avail themselves of this opportunity of being of service to new and inexperienced brother officers.

GENERAL NOTES ON WEST AFRICA.

The British possessions in West Africa are the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Northern Provinces and Southern Provinces). Portions of the ex-German Colonies of Togoland and the Cameroons are at present administered by officers seconded from the Gold Coast and Nigeria respectively.

The Gambia is a strip of territory on the banks of the river of that name, about 4,000 square miles in area, with a population of about 200,000. Sierra Leone is as large as Scotland, with a population of about one and a half millions. The Gold Coast, with Ashanti and the Northern Territories, is nearly equal in area to England and Scotland, and has a population roughly estimated at two millions. The area of Nigeria is more than five times the size of England and Scotland. Its population is about seventeen millions.

The number of European officials in each is approximately as follows:—

Gambia		40
Sierra Leone—		
European Colonial officials	250	330
Officers in the Garrison ...	80	
Gold Coast		700
Nigeria		1,750

All these possessions lie within the tropics. Owing to their great extent much variation of climate is met with, but considerable heat is general, as, except in the Northern Provinces of Nigeria, there are no very elevated tracts, and on the coast and near it the climate is also very moist. The climate should be

regarded with at least as much respect as would be given to that of the less developed parts of India, and officers should study how life may be made comfortable and healthy under the conditions they are likely to meet with. The general standard of comfort attained by Europeans in West Africa, if not equal to that reached in India, is improving, and individuals can do much to raise it if they will take the necessary trouble.

The seasons of the year are divided into the wet and the dry, and there is no cold season, except in some of the Northern Provinces of Nigeria and the northerly districts of the Gold Coast. In Sierra Leone the dry season lasts from November to April or May. In the Gambia the dry season extends from about the middle of October to about the end of June. The atmosphere is, however, moist as a rule in October, November, May and June, and therefore very trying to white people. In the Gold Coast the dry season lasts from December to March, and is followed by tornadoes in April and May. The rainy season lasts from June to November, usually with a break in August and September. In Nigeria the seasons are similar to those on the Gold Coast; but there is a marked difference in humidity between settlements on the coast, such as Lagos, Warri, and Calabar, and inland stations such as Oyo, Ifon, Udi, and Okigwi. In the Northern Provinces of Nigeria the dry season is cooler and at times cold.

The Harmattan, a dry, dusty wind, blows from the Sahara during the dry season.

OUTFIT AND PREPARATIONS IN ENGLAND.

The health and comfort of an officer largely depend on his taking out from England a satisfactory kit, which need not however be a large one. Details of the various articles required will be found in Appendix A, but it may be repeated here that no one should fail to take out an efficient mosquito net, a pair of well-made comfortable mosquito boots, a tropical sun hat, a white umbrella (or a black one with a white cover), and some quinine. All officers in Nigeria and all others who are at all likely to have to travel by land will require to take camp outfit, except tents, which will be supplied by the Government when required. Such officers should remember that 50 lbs., or at most 60 lbs., is the heaviest load that can be borne by one carrier, and that every thing must be bought and packed subject to this consideration. Accordingly they will do well to limit their baggage to the smallest possible compass and to the lightest possible weight. Those to whom economy is an object should beware of buying everything which the outfitter suggests as necessary, but, on the other hand, nothing is saved by omitting essential articles which will have to be bought later in West Africa, probably at higher prices.

Table crockery and cutlery, table linen, pots and pans and kitchen cloths, are required, and bed-clothes must always be taken out. A camp bed is necessary for all officers who have to travel.

Kitchen utensils should be packed separately from other articles, and so as to be available for service at once, if necessary, when landing in West Africa.

It is decidedly economical and often necessary to take out some provisions. At Freetown, Sierra Leone, it used to be possible to obtain provisions cheaply at the large stores, but provisions, crockery and cooking utensils are at present difficult to obtain there, and officers would be well-advised to take out a supply from England.

All officers proceeding to Nigeria should, if possible, take out a stock of the more essential provisions sufficient for 12 months. These can easily be disposed of if not required, and much inconvenience in very many instances is avoided by having them. One case should be specially packed with all that will be required for one week. Officers should stipulate to their agents that all provisions must be specially put up and packed for the tropics.

An officer should provide himself with a list of his packages, on a card or strong piece of paper, and a list of the contents of each package, which should be numbered on the outside for the purpose of identification.

VOYAGE OUT AND ARRIVAL IN WEST AFRICA.

Never be parted from your Mosquito Net.

The systematic use of quinine should be commenced the day before touching the West African coast, and kept up during residence in West Africa and for at least six months after return to Europe, unless an officer is medically advised to do otherwise. Inability to take quinine should be regarded as an absolute bar to residence in tropical Africa.

The systematic use of quinine may be followed in whichever of the four following ways may best suit the individual :—

1. Five grains every day (recommended).
2. Ten grains on Sundays and Wednesdays.
3. Fifteen grains on the 10th and 11th, 20th and 21st, and 30th and 31st (or last two) days in each month. The fifteen grains may be divided into three five-grain doses, each of which may follow one of the main meals of the day.
4. Ten grains on two consecutive days weekly, by preference Saturdays and Sundays.

Most people find that the best time to take the five-grain doses is just before the "big" breakfast or lunch. When the larger doses are adopted it is best to take them after dinner, so that the buzzing in the ears and deafness which are likely to follow may occur during sleep and rest, and not during the day, when they might prove troublesome. Quinine "tabloids" are commonly used, and it should be ascertained by experiment that such tabloids are capable of breaking

up easily and dissolving when placed in water. Anyone who finds that the quinine disagrees with him should consult a Medical Officer. If the daily dose of quinine is taken in solution it prevents the symptoms of dyspepsia, which are often brought on by taking of quinine in tabloid form.

A helmet should be worn during landing; and if the rains are on, it is necessary to have accessible a waterproof, an umbrella, and strong boots. By consulting the rainfall tables in Appendix F, the kind of weather to be expected on landing can be gauged with fair accuracy.

Officers proceeding to Nigeria receive orders regarding their station on the arrival of the steamer at one of the ports on the Gold Coast. They should be in readiness to disembark at the port mentioned in these orders. There are five ports for disembarkation in Nigeria, viz.: Lagos, Forcados, Bonny, Port Harcourt, and Calabar.

Officers proceeding to the Northern Provinces of Nigeria will find it advantageous to engage at least one servant, a cook or a steward, on arrival at Lagos, where there are usually many applicants available, amongst whom are many who have served with various masters in the Northern Provinces and have some knowledge of Hausa. A new comer should engage both. At Lagos, officers for the Northern Province will join the special mail train to the North proceeding viâ Jebba. In a few cases they may be sent on to Forcados and will there join a river steamer for the journey of several days' duration up the Niger to Lokoja. Final instructions as to destination will usually be received on the arrival of the ocean steamer at Accra.

In the Gold Coast, newly appointed officers will be met, as a rule, on landing, by an officer of the department to which they belong who will give them the

necessary information as to their quarters and instruction as to procedure. Where no officer is available to meet them instructions will be delivered to them on the steamer or on landing.

All officers are required to report themselves to the Head of their department and to the Colonial Secretary as soon as possible after landing at Accra, and to the Provincial Commissioner on landing at other stations.

In the Gambia, newly appointed officers will be met on arrival at Bathurst, and will be informed as to the quarters allotted to them and to whom they should report themselves. In Sierra Leone full directions as to landing, passing the Customs, etc., will be handed to officers on board the steamer on arrival. Officers will also be informed of the accommodation provided for them, and will be instructed to whom they should report themselves.

MOSQUITOES AND DISEASE.

"Form the Anti-Mosquito Habit."

Only precautionary measures are dealt with under this head. Directions for the treatment of malarial fever, when no doctor is available, will be found in Appendix E.

Malarial fever is a disease caused by the bite of a particular kind of mosquito (*Anopheles*), when the individual mosquito that bites is itself infected by the disease. The bite of a non-infected *Anopheles* cannot cause malaria. Only the females bite.

This disease has been subjected to a great amount of scientific investigation during the last few years, and has become associated particularly with the names of Sir Patrick Manson, G.C.M.G., M.D., F.R.S., and Sir Ronald Ross, K.C.B., F.R.S.

The former had shown that certain mosquitoes carried the germ of another disease.* From this and from what was already known concerning malaria he was led to suspect that malaria might be transmitted by mosquitoes. Sir Ronald Ross, after examining various mosquitoes in order to test this supposition, was able to show that there was great probability of its being correct. Sir Patrick Manson then clinched the matter by two experiments described by him as follows:—

> " Finally, on behalf of the Colonial Office and the
> " London School of Tropical Medicine, with the
> " assistance of Dr. Sambon and Dr. Low, I insti-
> " tuted two experiments which dispose for good
> " and all of any objections that otherwise might
> " have been advanced against the theory. Dr.
> " Sambon and Dr. Low, Signor Terzi, their servants

* Filariasis (minute worms in the blood.)

" and visitors lived for the three most malarial
" months of 1900 in one of the most malarial
" localities of the Roman Campagna, Ostia, in a
" hut from which mosquitoes were excluded by a
" simple arrangement of wire gauze on the doors
" and windows. They moved freely about in the
" neighbourhood during the day, exposed them-
" selves in all weathers, drank the water of the
" place, often did hard manual work, and beyond
" retiring from sunset to sunrise to their mosquito-
" protected hut, took no precautions whatever
" against malaria. They took no quinine.
" Although their neighbours, the Italian peasants,
" were each and all of them attacked with malaria,
" the dwellers in the mosquito-proof hut enjoyed an
" absolute immunity from the disease. Whilst
" the experiment was in progress mosquitoes, *fed*
" *in Rome on patients suffering from malaria*, were
" forwarded in suitable cages to the London School
" of Tropical Medicine, and on their arrival were
" set to bite my son, Dr. P. Thurburn Manson,
" and Mr. George Warren. Shortly afterwards
" both of these gentlemen, neither of whom had
" been abroad or otherwise exposed to malarial in-
" fluences, developed characteristic malarial fever,
" and malarial parasites were found in abundance
" in their blood both at that time and on the occur-
" rence of several relapses of malarial fever from
" which they subsequently suffered.

" The Mosquito-Malaria theory has now, there-
" fore, passed from the region of conjecture to that
" of fact."

These two experiments satisfied the medical world, and, since they were performed, a mass of information has been acquired which confirms them again and again.

Some men, through the accidents of a constitution exceptionally suitable to West Africa, and a certain amount of good luck, have succeeded in remaining many years on the Coast, and have come, and rightly so, by virtue of the work which they have done, into senior positions. Having passed through the ordeal of living on the Coast under the adverse circumstances of fifteen or eighteen years ago, they are often, and not unnaturally, unable fully to appreciate the necessity of precautions against malaria for the great majority of Europeans in West Africa. The prejudice is dying out, but a new-comer to West Africa must still be prepared to meet men who have no belief in the discoveries and experiments above mentioned, and he is warned not to allow their influence to dissuade him from taking essential precautions.

The chief of these are :—

1. **Always carefully to use a good large mosquito net kept in thorough repair.**

2. **The use of mosquito boots every evening after dusk until retiring.**

3. **Take quinine systematically.**

4. **Destroy mosquitoes and clear away their breeding places round the house** as far as possible.

Further details as to these precautions will be found under other heads of this pamphlet.

A mosquito has the same kind of life history as a silk-worm or butterfly. A female mosquito will lay about 250 eggs or more at a time on or close to water. In a day or two, there comes out of each egg a small creature (the larva) which swims about in the water eating minute plants, &c., and comes to the surface of the water to breathe. This stage corresponds to the silk-worm or caterpillar. In about a fortnight the larva

turns into a shrimp-like creature, which moves with great rapidity through the water by means of its curved thin tail-portion, and which breathes by coming to the surface of the water as the larva did. This shrimp-like creature is the pupa, and corresponds to the chrysalis stage of the silk-worm or butterfly. From the pupa, in the course of a few days, the imago or mature insect—the mosquito—emerges.

There are several kinds of mosquito which differ from one another in appearance and habits. Although only one kind carries malaria, it is well to wage war against all mosquitoes, because nearly all can carry some disease or other.

Two tribes of mosquito are especially common in West Africa, the *Culex*, which is the kind most frequently seen and heard, and the *Anopheles*, which can carry the malaria germ. See the illustrations opposite page 16.

The differences between these two are as follows :—

	Anopheles.	*Culex.*
Eggs.	Lying flat and scattered on water, almost always in *natural* pools.	Floating vertically in a mass on water anywhere, in water tanks, cups, &c., as well as natural pools.
Larva.	Lying flat when at the surface of water.	Hanging down at an angle from the surface of water.
Pupa.	Similar in both species.	
Imago.	Has tail end pointing in air when resting on flat surface, makes little or no sound when flying.	Has tail end parallel to surface it rests on, "sings" when flying.

In the males, the antennæ (or "feelers") are bushy in both kinds. In the females, two small processes, one on each side of the proboscis, called the palps, are short in *Culex* and long in *Anopheles*. The *Anopheles* of West Africa has short dark bars on the front edges of the wings; the *Culex* has no special markings on the wings.

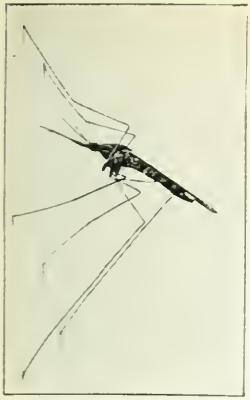
There is another family of mosquitoes, *Stegomyia*, the members of which will be easily distinguished by their general appearance (see illustration). They are striped black and white, and suggest a football costume. This is the mosquito which can transfer yellow fever from the sick to the healthy.

Its resting position is like that of *Culex* and its habits are very much the same, as it is a "domestic mosquito," that is to say, it commonly inhabits the interior of houses and other buildings. Its larva and pupa are very like those of *Culex* and are to be found in almost every collection of stagnant water round a house, such as an unprotected water tank, or in a sunken rain gutter at the edge of the roof, or in old tins and other receptacles left lying in or near the house.

In some towns the *Stegomyia* is more common than any other variety, and, as yellow fever has occurred in parts of West Africa, every effort should be made to destroy this mosquito and prevent its breeding.

Everyone going to West Africa should make it his business to learn how to distinguish between *Anopheles*, *Culex*, and *Stegomyia*, and how to find and destroy them and their larvæ.

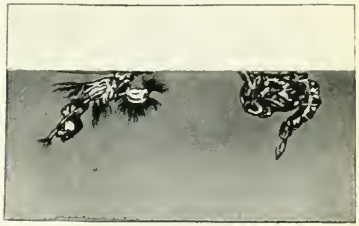
The importance of making war on all mosquitoes cannot be too strongly emphasised. From the life history of the mosquito, already described, it will be seen that the insect can be most easily attacked in its



ANOPHELES (FEMALE).

CULEX (FEMALE)

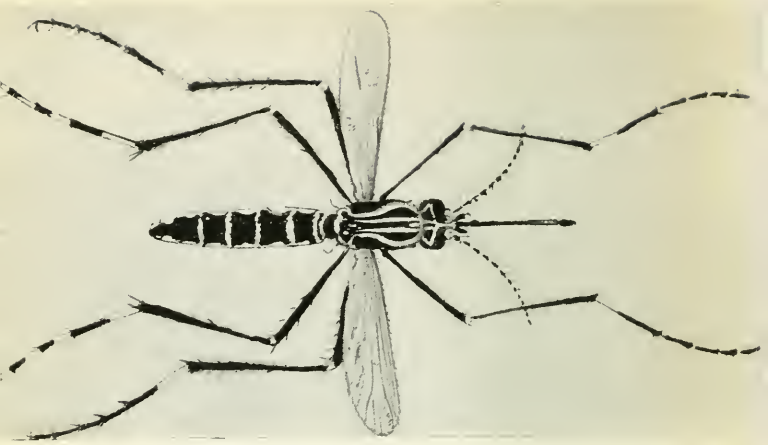
MOSQUITOES.



PUPA OF EITHER SPECIES ON RIGHT WHICH HAS EMERGED FROM SKIN OF LARVA, ON LEFT

CULEX, ON LEFT, AND ANOPHELES ON RIGHT.
LARVÆ IN WATER.

All these Diagrams are three times the natural size.



STEGOMYIA AND LARVA.

[*These two diagrams are approximately six times their natural size.*]

SCENES IN NIGERIA.

THE NIGER AT JEBBA.

SIR JAMES WILLCOCKS AND GENERAL KEMBALL STARTING FOR A JOURNEY IN CANOES

CAMP LIFE UP COUNTRY.

EUROPEAN HOUSE

SHOWING PART OF VERANDAH MADE MOSQUITO-PROOF BY WIRE GAUZE, WITH BLINDS TO PROTECT THE GAUZE IN BAD WEATHER. THERE IS A MOVABLE RAIN-SPOUT ABOVE THE WATER-TANK, SO THAT THE FIRST WASHINGS FROM THE ROOF AFTER DRY WEATHER CAN BE DIRECTED AWAY FROM THE TANK.

SITE OF EUROPEAN HOUSE AND TRADING STATION.
BAD, BECAUSE TOO CLOSELY SURROUNDED BY BUSH.

[Reproduced by kind permission of the African Society.]

water stage. This can be done by **permitting as little standing water as possible round dwelling-houses.**

Any small pools that cannot be drained or filled in should have a little cheap, thin oil (kerosene will do) poured on their surfaces once a week. The oil makes it difficult for the mosquito to cling to the surface of the water, and it also gets into the insect's breathing apparatus and chokes it.

Water tanks and the like must be carefully looked after, and careful and constant examination of the water made for larvæ ("wrigglers"). Wooden lids warp and shrink in the tropical sun, so do not fit sufficiently closely to prevent mosquitoes from entering and breeding, but over the lids it is easy to fit canvas bags filled with sand, and this will be found to be one of the best ways of closing the apertures round the badly fitting lid of an iron tank. Water barrels should have a sheet of canvas placed over the top and fastened to the staves by short nails. The pipes and holes which enter the tank, for the purpose of letting water in or out, must be carefully attended to and sealed with wire gauze, or other means which will prevent mosquitoes from entering. The water contained should be freely "kerosened" on its surface weekly; this has absolutely no effect on the taste of the water (which is drawn off by a tap from below), and is the best way of killing off larvæ which may be present in the tank, and of preventing further breeding.

The edges of any river, small stream, or ditch, near a house must be carefully cut and trimmed so as to prevent the formation of little stagnant pools and back waters in which *Anopheles* would readily breed.

All gutters should be kept clear of grass and weeds, as it is found that *Anopheles* shelters among them. All

gutters attached to the eaves of houses are liable to sag and choke with foreign matter and so hold water: hence they are prolific sources of mosquito breeding. Roof gutters should be cleaned out systematically twice a week, and sagging gutters should be attended to so that they drain freely.

It is astonishing how soon a mosquito, especially *Culex* or *Stegomyia*, makes use of any water it may find to breed in. It is usually necessary to stand each leg of a meat safe or table, on which jam, sugar, and the like are kept, in small tins of liquid in order to prevent ants from eating the food, &c. *Culex* always breeds in these tins if water is used, unless the water is completely changed once a week, or unless vinegar or something acting similarly is added to it, so it is preferable to fill such tins with kerosene instead of water. Again, *Culex* will breed in the small cups of water used to keep a wet bulb thermometer moist, or in a water jug left in quarters which have been vacated for a short time, or in a water cooler which is not regularly emptied. An officer may go into the bush travelling for a fortnight or more, and when he comes back, if the water jug has not been emptied, he will often find his rooms full of mosquitoes.

It is, however, the *Anopheles* mosquito which is the more serious danger. There are two species which are common in West Africa, one brown, the other black-looking, and both of these, as already mentioned, usually breed only in pools of water which form naturally. Collections of water in manufactured vessels can, however, after a time take on the peculiarities of natural pools, *e.g.*, if a new canoe gets some water in it after a shower of rain, *Anopheles* will not, as a rule, breed in this, although *Culex* will; but in the case of an old canoe, or a new one which has been left by its owner in one place for a couple of months, moss, grass, &c.,

accumulate round the sides of the contained water, and for all practical purposes the canoe forms a natural pool in which *Anopheles* will breed. They will also breed in the big wooden mortar in which natives beat up and mix their food, if this article is left for two or three weeks where water can get into it; and in a country where most journeys are made on foot it is no uncommon thing for a canoe or a house to be left uncared for during two months or more.

In the case of bamboo cut midway between two joints and stuck vertically into the ground to make railings or fences, the top of the stick forms a little cup and will hold water in which *Anopheles* will breed. It might be thought that such a small collection of water would dry up quickly; but, in the rains, grass and other vegetation are apt to grow up sufficiently high to protect the top of the fence from the sun, and also from heavy downpours of rain which would wash out the larvæ.

These are only a few examples of how water can collect and in time become a breeding place for mosquitoes. Everyone who looks about carefully will find many others. A large leaf which in the dry season has had its edges curled up, like leaves in autumn in England, may be so lying when a shower of rain comes as to collect water and form a pool and mosquitoes have often been found breeding in such a pool.

Puddles, if exposed, may be dried up by the direct rays of the sun or washed out by a heavy downpour of rain, or the concussion of the drops of rain on the surface may seriously damage the larvæ, although these creatures can defy both sun and rain for a time by living in the mud at the bottom of a pool.

It is not, however, exposed pools that are the difficulty. They can be seen, and it is only gross folly not to deal

with them. The difficulty is in finding out-of-the-way collections of water near fences, forks or roots of trees, and old drains, which often have long grass round them. Accordingly all grass and vegetation should be kept cut close to the ground for sixty yards, or, better, a hundred yards, round a European dwelling. A few ornamental plants and shade trees may be excepted if puddles are not allowed to form beneath them. Many plants have natural cups holding water, and many trees, particularly when old, have hollows in which water lies; both are dangerous, because mosquitoes are able to develop in the small collections of water.

Instructions similar to the above have been given and are well known in all West African stations. By their close observance an enormous amount is gained not only as regards health but also in comfort; but it is not unusual to find that they have not been carried out.

On sunny days the doors and windows should be opened. On dull days *Culex*, if breeding near, is liable to get in if the house is opened, although *Anopheles* will never be seen after 6.30 a.m. or before 6 p.m. unless the house is absolutely and closely surrounded by bush.

A most important fact, always to be borne in mind when travelling in selecting a site for a camp, is that the principal source from which the mosquito obtains the malaria parasite is the native children. Practically all native children may be regarded as infected with malaria, and therefore all *Anopheles* in native houses should be regarded with the greatest suspicion, and the neighbourhood of native houses or native children should as far as possible be avoided for European houses or camps.

It has been proved that the separation of Europeans from Natives is one of the most efficient means of protection against diseases endemic among native races. Even partial separation, such as sleeping outside the native quarters at night time, affords a very considerable degree of security.

PERSONAL HYGIENE.

"Prevention is better than Cure."

The chief diseases to be guarded against in West Africa are malaria, dysentery and yellow fever. These diseases are all caused by the presence of a special parasite. A low condition of health predisposes to attacks by these parasites; therefore everything that tends to strengthen the body should be encouraged, and everything that tends to weaken the body avoided.

The sun, the wind, and the rain are three elements which may damage the body from without and so make it more susceptible to the attacks of parasites.

It is of paramount importance to **wear a helmet when in the sun,** and when possible to use a white umbrella. The umbrella should be lined with stuff of red brown colour. Even if the sun is somewhat obscured by a haze, it is still necessary to wear a helmet.

The high temperature of the air causes the body to perspire after but little exertion, and even when not perspiring the body always has, in hot climates, a great volume of blood circulating just under the skin; consequently, if the wind blows strongly, the body, unless protected by suitable clothing, may lose a considerable amount of heat suddenly, and so have its vitality lowered. Similarly as regards rain, wettings are more liable to cause chills than in temperate climates.

Chills often induce attacks of fever in persons whose blood contains malaria parasites.

Accordingly, a helmet, white umbrella (lined), flannel suitings, and a waterproof are essential, and, in some places, indiarubber boots are very useful. These articles cannot always be obtained on the Coast.

The four classes of essential precautions against malaria have been mentioned under that head. Three of them fall also under the head of personal hygiene.

1. Always carefully to use a good large mosquito net kept in thorough repair.

2. To wear mosquito boots every evening after dusk until retiring.

3. To take quinine systematically.

With regard to the first precaution, even the smallest holes in the net must be promptly mended, and the bottom of the net must be properly tucked in between the canvas of the bedstead and the mattress or blanket upon which the sleeper will lie. The practice, usual in some places, of having the net weighted at the bottom and allowing its bottom edge to lie on the floor is a bad one, because mosquitoes often shelter in the day under the bed, and when the net is turned down they are inside it and attack the sleeper. Mosquito rods forming a frame above should be fitted to every bed, **the net being slung inside the framework, and not stretched over the outside of it.** (See illustration). During the day, when the net is not required, the bottom part should be roughly twisted together and laid over the top of the net; shortly before sunset the net should be lowered and tucked in as described. It is no uncommon thing to see a man who imagines that he is getting the benefit of a mosquito net when his net contains one or more holes or is allowed to hang round the bed at its lower part so that it is liable to be caught up on a chair or pair of boots, leaving ample space for mosquitoes to get in. A common habit of native servants or "boys," only mentioned to be condemned, is to keep one of the long sides of the net raised during

the day, thus providing a convenient shelter inside the net for any wandering mosquito. The details of the mosquito net are discussed in Appendix A.

With regard to the second precaution, the advice given on page 9 should be most carefully attended to. The **bi-hydrochloride** of quinine is one of the best preparations. It is best taken dissolved in water. The tablets should be wrapped in paper and crushed, and will then dissolve readily in a quarter of a small tumblerful of water.

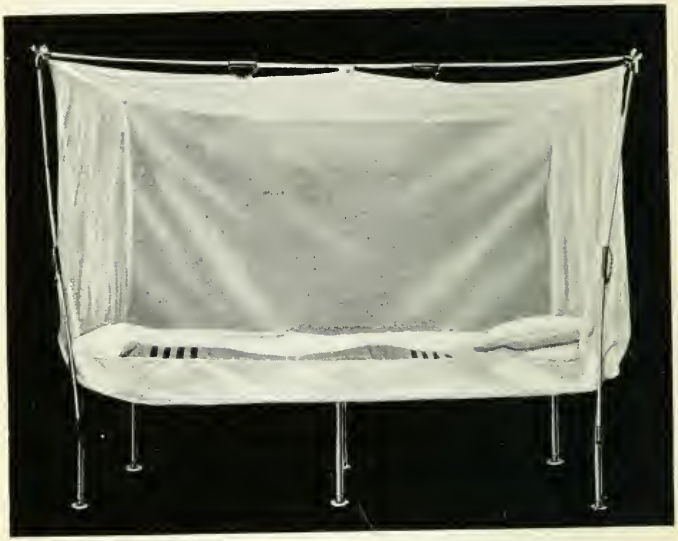
It is preferable to have the bi-hydrochloride of quinine, as the bisulphate is not nearly so soluble as the bi-hydrochloride.

Officers are specially warned of the danger of taking tablets dry like a pill. After a while tablets often become hard, do not dissolve in the stomach, and are excreted unchanged. The result is that the quinine does not enter the system, and that the malarial parasites are not killed off when they get into the blood, and a false sense of security is set up; the person thinks he is protected from malaria, whereas he no more "digests" the quinine than he would a cherry-stone.

Some Old Coasters think that if a man takes quinine every day the drug will lose its effect on him, and that he will therefore be in a sorry plight if he does get fever. The newcomer may rest assured that there is no foundation for this belief.

A man's system is, as a rule, quite clear of a five-grain dose of quinine in less than twenty-four hours, and it is for this reason that a frequent dose is so important.

It is wise to give personal servants a ten-grain dose of quinine once or twice a week, both for their own benefit and to prevent them from infecting their masters with fever.



MOSQUITO NET.

IN POSITION ON CAMP BED, TUCKED IN BETWEEN THE MATTRESS AND THE CANVAS OF THE BED.

(By kind permission of Messrs. Way & Co.)

Dysentery and other troubles are avoided by drinking only water that has been boiled, and by taking care that all soups, tea and coffee, &c., are made with boiling water.

Sometimes radishes and the like are grown by Europeans and eaten raw as is the custom in England, but in all such cases water that has boiled must be used to wash the vegetables; and it is held by some to be safer to add salt to the water.

A pinch of permanganate of potash or some Condy's fluid should be put into the bath water, and plenty of soap (carbolic recommended) should always be used. Bath water should be just warm, as cold baths are more liable to cause chills than in England, and hot baths induce sweat.

Jiggers are most plentiful in sandy places. They are sand fleas which eat into the skin, usually about the toe-nails. They can be avoided by never walking about in bare feet and always keeping boots and shoes at a height above the floor when not in use, by having the wooden floors polished with beeswax and turpentine, and by seeing that they are thoroughly swept daily. On getting into bed men often leave their slippers on the floor at the bedside; the next morning they thrust their feet into the slippers and proceed to dress, thinking that by wearing the slippers they will escape jiggers. But jiggers will walk into a slipper while on the ground empty. Slippers therefore should be placed on a chair by the side of the bed. Boots should be kept high on the top of boxes or hung by the tabs to nails in the wall.

Jiggers which have penetrated the skin must not be neglected. A description of how they can be removed is given in Appendix E.

In order to prevent contamination of clothing, and possible skin disease, it is proper to insist that no native's clothes should be washed at the same time as a European's. The Europeans at a station usually pay the washerman a substantial salary, and it is only fair that their washing should be kept distinct from any native's washing he may get.

CARE OF QUARTERS.

All furniture should be at least a foot from the wall of the room so that a servant can fan and dust behind it every day. If heavy furniture is placed close to the wall, as is usual in England, mosquitoes, &c., will hide behind it during the day. If clothes are hung on a wall they should be completely covered by a white cloth reaching to the ground, in order that mosquitoes may not hide in them.

The following rules, among others, apply to official quarters in Lagos and will be useful for the guidance of officers in other parts of West Africa :—

(1.) The occupant is responsible for the care and cleanliness of the quarters and compounds; the latter should be adequately cleaned at least once a fortnight, and the former cleaned at least three times a week by wiping down the furniture and floor with a duster moistened with a weak solution of some disinfectant fluid such as Jeyes' fluid. (It is advised that thorough dry-scrubbing, with a little bees-wax and turpentine, be adopted as the method of cleaning boarded floors.)

(2.) Window glass should be cleaned at least once a week; and jalousies frequently.

Jalousies should be opened and worked daily. (They are a favourite haunt of mosquitoes in the day-time.)

(3.) Responsibility for the care and cleanliness of furniture rests with the officer to whom it is issued and who has signed for it on the inventory form.

(4.) (i.) No rubbish, offal, or dirty water of any description, should be thrown on the surface of the ground in the neighbourhood of a well for a distance of at least 10 yards from the latter.

(ii.) To prevent leaves and dirt from being blown into the well by wind, the cover of the well should always be shut down except when water is actually being drawn.

(iii.) Tanks should be most carefully examined at least once a month, and cleaned out if there is evidence of the slightest contamination by any vegetable or other substance.

(iv.) The first rain-water from a roof, after a period of dry weather, should not be allowed to enter the tank.

(v.) Tanks must be kept free from mosquitoes (*i.e.*, they must be made mosquito-proof, and kept so).

See chapter "Mosquitoes and Disease" (page 12), for directions as to how to do this, and how to keep down mosquitoes in the neighbourhood of dwelling-houses.

FOOD AND DRINK.

Never eat tinned food if you can get fresh.

Avoid all over-ripe fruit, and meat or fish which is the least bit tainted.

When a tin of provisions—animal or vegetable—has been opened, its contents must at once be emptied into a glass or earthenware vessel. Neglect to do this is a frequent source of ptomaine poisoning, and one's servants have to be constantly kept up to the mark in this respect, as they cannot see the necessity for the precaution.

In some parts of West Africa chickens are the chief fresh animal food, but they are very small. A good plan is to buy a number of live chickens, according to the size of the place they are to be kept in, and to give them a small feed once a day of rice, maize, or other grain. In a month they are much better eating, and well repay the trouble.

Beef, mutton, and goat-flesh can generally be obtained.

West African yams are large potato-like tubers and are of two kinds. Both are of a yellowish white inside, and the smaller of the two kinds has a pink layer just below the skin. The larger are called yams simply, and the smaller coco-yams; the former are the better eating.

On the coast potatoes may sometimes be bought from the steamers.

The pawpaw looks like a small vegetable marrow, but grows on a tree. When ripe it is eaten as a fruit; and when unripe it can be boiled and served like a vegetable marrow, from which when properly cooked it is practically indistinguishable.

Certain kinds of leaves, such as the young leaves of the coco-yam, can be chopped up fine and served like spinach.

Banana, orange, pineapple, and certain kinds of plum, are common. Mango, guava, &c., grow in some places.

When travelling, biscuits may be used in the place of bread, but, when stationary, bread is easy to make (see recipes in Appendix D).

Beef should be firm, of a deep red colour, not flabby, sodden, or watery. The flesh should consist only of meat fibres, fat, and gristle. There must be no minute white spots on or between the meat fibres.

Goat meat is paler in colour than beef and there is not much fat as a rule.

It is very important to know that a beast intended for food was slaughtered and that it did not die from disease.

A humane way to kill a bullock is to have the animal tied up by the head close to a tree or post, and then to shoot it with a revolver. The revolver should be held about six inches from the centre point of the frontal bone, *i.e.*, midway between the upper border of the eye socket and the lower border of the horn of the opposite side. The animal falls unconscious at once. It should be bled five minutes afterwards.

Fish is usually plentiful and good on the coast.

With regard to drink, water and palm wine are the two beverages of the country. Palm wine should not be drunk unless it has been seen collected, otherwise it is very likely to have been mixed with water from some infected pool or stream.

Water should be filtered, and must always be boiled. It is important to use a filter of the best kind, and

to keep it clean. "Stand filters" are supplied for use in bungalows or station houses, and the "candles" of these should be thoroughly scrubbed and boiled once every week; on the least suspicion of a crack in it, a candle should be at once condemned and replaced by a new one. The Doulton, Pasteur-Chamberland, or Brownlow filters can be recommended, but the ordinary carbon filters are worse than useless. The filtering can be left to a servant, but the European should always go daily and **see that the water is actually boiled.** The vessel of boiled drinking water should then be covered up and placed to cool on a piece of wood in a soup plate full of water, to keep it free from ants.

In addition to a filter, a water cooler is almost a necessity, as lukewarm or tepid water is a very uninviting drink. Water coolers can be obtained in most towns, and when filled with water (filtered and boiled) and hung up in a breeze, the water becomes quite cold by evaporation. Any liquid in a bottle may be cooled in much the same way by wrapping a piece of wet flannel round the bottle and placing it in a breeze half-an-hour before it is required.

A Thermos flask is also a useful article to have on patrol, but, owing to its being so fragile, it is necessary to stuff it with cloth or paper when not in use, so that it is not cracked by excessive vibration.

Water, if muddy, should first be strained through a piece of linen, such as a handkerchief. If it is still thick and difficult to filter, it can be placed in a large basin and a little alum added to it, six grains to the gallon being the usual quantity. The alum causes all the fine particles in the water to sink to the bottom of the basin in about six or eight hours. The addition of a little lime is occasionally an advantage.

It is necessary to distinguish between straining water to get rid of solid matter suspended in it, and sterilising it to make it free from germs. It is difficult to keep any filters free from germs, and accordingly **water should be first filtered and afterwards boiled.**

Alcoholic drinks, if taken, should be consumed only at meals, and preferably at the evening meal. **Heavy drinkers should not go to West Africa, moderate drinkers should be very moderate there, and total abstainers should remain so.**

For a short list of suitable tinned foods and for cooking recipes, see the Appendices A and D.

TRAVELLING AND BUSH LIFE.

In certain parts of tropical West Africa, a considerable amount of travelling is done on rivers by means of steam launches or native canoes.

When travelling in a canoe it is very important that Europeans should have an awning, at least two mats thick, over them to shelter them from the sun. The natives can easily arrange an awning by means of sticks cut in the adjacent bush.

Should a tornado be about to break, shelter must be taken in the bush, or at least the mat awning must be removed, otherwise there is grave risk of the canoe capsizing. The removal of the awning is necessary on such occasions in all small boats.

Land travelling is done on foot, in hammocks, on bicycles, and, in some parts of the interior, on horseback. Motor bicycles are rapidly coming into use in many parts of Nigeria, but "light weight" machines are preferable. There are motor transport services in certain parts of Nigeria and the Gold Coast. There are railways in Sierra Leone, the Gold Coast, and Nigeria.

To prevent blistered feet on the march, avoid tight boots and rub some nearly dry soap on the feet before starting; some people prefer vaseline or hazeline.

Loads must be kept within about 50 lbs., which, as has already been said, is the heaviest weight an average carrier can manage.

In getting ready for a march, the first thing to do is to have all the loads arranged in one line, about six feet

from one another. The carriers are then chosen according to their strength and placed beside their loads. The strongest carrier should always be given the bed, mosquito net, and bedding. At the same time, it is very important that the bed load should be kept as light as possible, because the uncertainties of a march are considerable, and the lighter the load the less handicapped is the carrier when he meets difficulties. The other loads are distributed among the carriers according to the importance of the load and the ability of the carrier to convey it.

If there is a good headman of the carriers, he will attend to these matters better than the European can.

It is best for the European to travel last; he can then be certain that no load is left behind, and, should any accident happen to a carrier, the European will soon come up to the place and can decide what is best to be done.

Most Europeans on foot, without hammocks, will find ten miles a day a fair average march.

When one's clothes get wet on a march in the rains, the best plan, if the rain is still falling, is to make a fire under a shed and spread them on sticks above it, at a sufficient height to avoid blackening them with smoke. A sheet of corrugated iron, if obtainable, makes an admirable drying tray.

It is repeated here, as being a matter of prime importance, that **the site of a camp should always be as far as possible from a native town and native children.**

In Freetown, Sierra Leone, there is at present no rest house for the use of Government officers passing through on the way to the Protectorate or going on leave. There are, however, hotels providing fairly satisfactory

accommodation, but they are expensive. Rest houses also exist in the various districts for the use of officers on patrol.

In the Gold Coast, especially up country, rest houses are commonly provided along the main routes, about a day's hammock journey apart, for the use of European officials travelling.

If it is necessary to lodge in a native town, seek for the most isolated house that you can find on its borders.

The officer should be prepared to deal with the more common cases of sickness among carriers. They are particularly liable to get their feet cut with jagged pieces of stick, and these wounds should at once be attended to, for fear that the germ of lockjaw, which is always present on the ground, should get into the wound. For the method of treatment, see Appendix E. They are also apt to suffer from constipation.

Mosquitoes are kept off to a certain extent by the smoke of a fire, but the safest plan is always to finish the march about 4 o'clock, so that the carriers and the European can eat before dark.

A waterproof cape is useful when marching in the bush in the early morning; it protects the shoulders from the dew dripping off the leaves.

A bush latrine can be made by digging a hole and placing across it horizontally, at a convenient height from the ground, a thick bough, supported at each end beyond the hole by means of Y-shaped branches. If necessary, it should be roofed in.

Care must be taken to prevent thefts of Government money when travelling. The cash boxes should be placed under a trustworthy guard, and should be

fastened at night with a padlock and chain to an immovable object, close to where the European is sleeping, or to his bed.

If Government money is entrusted to an official on first arrival for transport, he should be most careful to ascertain the regulations for its safe custody, and to see that they are rigorously observed.

It is advisable when crossing rivers with money to fix floats at the end of long ropes to each of the specie boxes, so that if the boat capsizes the boxes can be pulled up or easily located by divers.

Compensation for losses from fire in West Africa will not be paid by the Government where insurance against such loss could have been effected on reasonable terms. The names of certain insurance companies who have stated that they are prepared to undertake such business may be obtained either from the Crown Agents for the Colonies, 4, Millbank, S.W., or locally from the Colonial Secretary of any of the West African Colonies; and there are probably other companies also.

WORK AND AMUSEMENT.

The working hours in West Africa vary greatly in the different Colonies and Protectorates, but a good plan is to get up early and do as much work as possible before 11 a.m. This leaves the hotter part of the day for what is usually the smaller half of the work.

An early breakfast of, say, a rasher of bacon or an egg, with tea, is usually taken on first getting up in the morning, about 6.15. It is of importance never to go out without having first eaten at least a biscuit. The remaining meals vary according to the Colony, and the work that has to be done.

A day's work in West Africa is much the same as a fair average day's work in England. If what has to be done is done regularly and with method, an officer will rarely have any serious difficulty in performing his duties.

In out-stations a great deal of customs, post office, and other administrative work is performed by native clerks, who daily make out papers which require for their completion to be examined and signed by the European officer in charge. Such papers should be dealt with at once whenever possible, as if they are put on one side for other work they may have to be dealt with in haste when the mail day arrives, and errors and occasionally defalcations may be overlooked. The errors may or may not have serious consequences in themselves, but in any case they cause needless work to the staff at headquarters and to the officer himself, while if defalcations are overlooked from carelessness the officer may have to make them good out of his own pocket.

An officer on first arrival should be most careful to obtain and familiarise himself with all the regulations affecting his particular duties, and when in doubt to ask advice.

Officers who have to travel should always arrange their journeys so that the in-coming and out-going official mails are not neglected.

Twice at least in every month the routine office and storekeeping work should be carefully checked. It is not pleasant for an officer who works hard to find himself placed in an unfortunate position through the mistakes or neglect of his native clerk; and all officers are held responsible for the supervision of the work of those subordinate to them.

Officers will find it absolutely necessary for the proper conduct of business that correspondence registers and other official records should be carefully compiled and kept up to date, and that individual papers are methodically stored, arranged according to subject, number, or date. The Governor and any inspecting officers who may visit the station will ordinarily examine the books and call for correspondence to see that it is properly kept, or for actual use, and any long delay in producing papers called for is a sure sign that there is something wrong with the system or with the way in which it is being worked.

Officers in charge of cash should never leave their offices for the night until they have balanced the cash in the safe against the amount shown in the books.

Government stores should be regularly checked to see that they tally with the entries in the books regarding them.

Official books of record vary much in different places. Officers in charge of districts usually have to keep

or superintend the keeping of the following books, or local equivalents for them :—

Correspondence registers, Treasury books, Law books with alterations appended, Court books, Standing Order book, Instructional files, Store books, Prison books, Transport books, Intelligence book, Officer's official diaries.

Every officer should use a diary or some other means of bringing to mind duties which require to be discharged periodically, and things which should be done on particular days.

Games, chiefly golf, bowls, cricket, and tennis, are played in the late afternoon from about half-past four, at all events at the larger stations. Polo is played at Bathurst, Accra, Kumasi, and at several stations in Nigeria. In any case Europeans should always take brisk exercise every day equal at least to a two-mile walk. Exercise readily causes sweating, and it is essential that those who indulge in games should immediately afterwards take off wet clothes, dry the body, and put on dry underwear before sitting down outside in the cool of the evening.

THE RETURN TO ENGLAND.

Shortly after leaving the Coast, particularly after leaving Sierra Leone, the north-east trade winds are met, and the liability of men returning from the tropics to contract chills when exposed to these winds is very great. They should be careful not to sit on deck in the light clothing that people are accustomed to wear in West Africa.

A man with a few malarial parasites in his system may very easily induce their multiplication by contracting a slight chill, and so these parasites (which, had he exercised care, would probably have become innocuous during his leave) may be the cause of serious illness upon the voyage. Accordingly heavier clothing should be worn when on board ship. During the voyage home and afterwards quinine should be taken in accordance with medical advice.

Even though he has had no fever on the Coast, a man must not think that he is safe from fever when he leaves the place of infection. The malaria parasites contracted in Africa are not left behind when the African coast fades away on the horizon. They may live in the body for over two years after the return to Europe. Ignorance or neglect of this important fact has caused much sickness and even death. The majority of physicians who practise in tropical medicine in England are agreed that they see, case for case, severer cases of fever in England than they ever did abroad.

It is therefore a matter of paramount necessity to have warm clothing during the voyage home and to

take quinine regularly every day during the voyage, and in England as advised by the medical officer.

To sum up :—

(1) Be careful of the change of diet when first getting on to the ship.

(2) Live regularly.

(3) Do not remain on deck after sunset without putting on an overcoat.

(4) Gradually put on thicker clothing as required.

(5) Avoid draughts and chills.

(6) Continue the regular use of quinine on the voyage home, and according to the orders of the medical officer who examined you before leaving West Africa.

APPENDIX A.

OUTFIT.

All officers are recommended to provide themselves with the following articles :—

Mosquito net.

*White pith sun hat, with puggaree.

White umbrella, lined.

Large kettle or camp saucepan, to hold at least five pints, for boiling water.

Lantern, to burn candles or vegetable oil.†

A few Medicines, &c., as described on page 49.

Two cases of provisions.‡

The most recent map, or maps, of the Colony or Protectorate to which they are proceeding.

Mosquito Net.‖—An illustration of a good pattern is given opposite page 25. The net is a most important item of outfit, and careful attention should be given to the following

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* The Cawnpore Tent Club pattern, or as an alternative Ellwood's Patent Helmet is recommended.

† Lord's wind-proof lamp to burn kerosene, though more expensive, is specially recommended for Nigeria.

‡ Not necessary for officers going to and remaining at Freetown, Axim, Sekondi, Cape Coast, Accra, Lagos, or Calabar.

‖ All first class officers going to Sierra Leone who are likely to spend part of their time at headquarters should provide themselves with two mosquito-nets, one (sand fly proof) for use with a camp bed, the other for the large bed supplied by Government. In the Gambia nets should be made of butter muslin on account of sand-flies.

details. The material should be double for about 18 inches above the bed to protect the limbs of the sleeper from being bitten through the net. The part of the net which is tucked under the mattress may usefully be strengthened with calico or other stuff to prevent it from being torn. The top of the net should be made of the same material as the sides, and not of calico as is often the case. The net should be white, in order that mosquitoes may be more readily seen when brushing down its inner sides. It should be fitted with rings and cords, so that it may be suspended from the mosquito rods, or the roof if necessary.

In order that the air inside may remain fresh, the net should be as large as possible, and should not be in the shape of a bell or an inverted V, but have a flat top.

It is a disputed point whether the material of the net should be ordinary mosquito netting, or some closer material such as book muslin, cheese cloth, or butter muslin. The advantage of the closer materials is that they afford complete protection from every insect, including the annoying sand-fly, but sometimes they are found to exclude fresh air to an undesirable degree. The mosquito net chosen should be 16 meshes to the inch to 20 meshes ; the latter is preferable, as it keeps out sand flies, often very annoying and disturbing to rest and sleep.

Clothing.—With regard to clothing, several flannel tennis or khaki drill suits, an old serge or tweed suit, and a light waterproof are required, and also an overcoat for use chiefly on the voyages. The seams of the waterproof must be sewn and not stuck together. Waistcoats are not worn except on the voyages, but kummerbunds are useful. In Nigeria there is a special (optional) dinner dress (see Appendix C). Officers of the higher grades going to other parts of West Africa should take out a dress suit, with dinner jacket. This will also be wanted on the voyages.

Plenty of thin summer woollen underclothing should be taken out, and also heavy underclothing for the voyages.

In the Gambia and many parts of Nigeria some warm clothing is essential, as cold days and nights are experienced at times.

It is unwise to wear cotton next to the skin, and a flannel shirt, or linen or cotton shirt with woollen undervest, should be worn. Shirts, vests, and drawers should, when possible, be changed once every day, and at least eight of each are needed. Shirts with turn-down collars are suitable. Needles, thread, buttons, &c., will be wanted for repairs.

Two pairs at least of stout brown leather boots are recommended, and dubbin should not be forgotten. For the Northern Provinces of Nigeria, a third pair should be taken. For the bush, boots should be well nailed. Mosquito boots should be bought in England when an official comes out on his first tour; subsequently he can have similar boots made locally on the Coast at less expense, but it is important that the new comer should be provided with them in the first instance. Boots give greater protection than shoes against mosquitoes and tsetse flies. When on trek the end of the trousers should be tucked into the socks as tsetse flies seek the ankle so as to get in under the open end of the trousers. Shoes should only be worn when playing tennis, cricket or other games.

All clothing, more especially if woollen or merino, must be kept in air-tight steel trunks to preserve them from moth and mould. A few naphthalene balls or camphor squares should always be placed amongst the clothes to help in preserving them. In case of woollen clothes it is necessary to take them out of the boxes at least once a fortnight, examine them for mould, brush them thoroughly if necessary, to remove any traces of mould, place them in a bright sun for a couple of hours to remove dampness, then replace in the box, which should also have been put out into the sun, not forgetting to replace the camphor and naphthalene among the clothes.

Miscellaneous.—All officers should take out towels, blankets, sheets (if used), pillow and pillow cases, crockery,

cutlery, table linen, saucepans, kettle, frying pan, and kitchen cloths.

Valuable watches should not be taken as they are likely to be spoiled, but several, two or three, good and fairly cheap watches are useful. Spare glasses should be taken out for each watch.

The Royal Geographical Society's "Hints to Travellers" (15s. net) contains useful information as to equipment, surveying, natural history, ethnology, photography, &c.

Officers going to Hausa-speaking districts should take Robinson and Burdon's Hausa Grammar (Kegan Paul, 5/-). Other useful books on Hausa are Miller's Hausa Notes (Oxford University Press), and Robinson's Hausa Dictionary (2 vols., Cambridge University Press).

Camp Outfit.—Medical and military officers, all officers going to Nigeria (except those who will remain in Lagos town or on the Railway), and all officers whose duties may require them to travel inland otherwise than by railway in any of the other West African Colonies, should take out camp outfit, except tents. Tents will be supplied by the Government when required.

The needs of officers falling within one or other of the classes just mentioned differ so much, according to the amount of travelling which they will be called upon to do and the resources of the districts in which they will travel, that it is not possible to give more than an approximate idea of the articles which they will require. The list given on next page may be regarded as a minimum for an officer who will travel a good deal, and officers who expect to travel much will be well advised to take out a slightly more extensive kit, but should not greatly add to the bulk and weight of the outfit. On the other hand, those who will only make a short journey to an inland station and back again at the end of their tour of service will find it possible to do without a good many of the articles in the list.

In addition to the articles mentioned in the preceding list as necessary for all officers whether they will travel or not, travellers will require most of the following articles :—

*Pump filter, with stirrup and six spare candles, in case, or a small size portable drip filter with at least three spare candles.

"Compactum" (or other) camp bed, mosquito rods, mosquito net, three blankets, pillow and two pillow cases, in waterproof canvas bag.

Waterproof sheet, about 8 ft. by 6 ft.

Bath and washstand (combined).

Canvas bucket.

Camp table and camp chair or deck chair.

Water bottle, large, felt-covered, of enamelled iron or aluminium.

Cooking and eating utensils.

20 yards of muslin, for making houses mosquito proof.

Indiarubber boots, reaching to the knees, not lined with felt.

Two air-tight metal uniform cases, not larger than 44 ins. by 16 ins. by 11 ins., with name of officer painted on.

|| Revolver and ammunition.

Small compass.

Hammer, nails, case opener.

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*See page 31 as to filters.

|| Officers going to the interior of Nigeria are required to take a revolver of ·455 bore. See page 48. In Sierra Leone a shot gun may be substituted.

The following list will serve as a guide to the cooking and eating utensils needed. Some of the articles are the same as have already been mentioned under the heads "General" and "Miscellaneous." These need not, of course, be duplicated.

Two kettles.

Nest of three steel or aluminium saucepans with detachable handles.

Frying pan.

Small mincing machine for preparing tough meat.

Three pots, for salt, pepper, and mustard.

Metal tea-pot.

Two block tin or aluminium provision boxes, about 9 ins. by 6 ins., for sugar, and bread or biscuits.

Enamelled iron (or stout crockery) plates, cups, saucers, knives, forks, tea-spoons (two of each article); table-spoon, soup-spoon, enamelled iron (or stout crockery) meat dish, two metal tumblers.

Cook's knives, forks and spoons, two of each.

Small metal "Sparklet" bottle and "Sparklets."

At a slightly increased cost, some of the articles may be got in the form of a small luncheon basket, and one of the kettles may be replaced by a copper kettle with a screw lid and a screw stopper to the spout. This kettle will serve instead of a teapot, and also to hold water during marches.

A portable lamp and a lantern or hurricane lamp are also necessary.

The bed, bedding, mosquito net, etc., should be made up with special care as a single load, which must be thoroughly waterproof. A cork mattress may be added if desired, and three good blankets are recommended as a great comfort, particularly in those parts of Nigeria where the temperature falls at night to anything between 40° and 55° F.

Some officers prefer to take, instead of a canvas bath, a metal hip bath, with a wicker lining, which serves to pack things in.

All clothing must be packed in the air-tight uniform cases for travelling.

If the eyes are likely to be sensitive to the glare of the sun, smoked goggles should be taken. Men who can shoot for the pot will like to take a shot-gun and cartridges.

Northern Nigeria.—Officers going to the Northern Provinces of Nigeria must also take saddlery and horse requisites, suited to ponies not usually exceeding 14 hands, and riding breeches and gaiters.*

A drip filter, in addition to the pump filter, is often useful. Two or three water bottles should be taken for marches.

Officers of the Political and Medical Departments, and others whose work may involve their travelling in the interior of Nigeria, are also required to provide themselves with a brown leather belt, ammunition pouch, holster, and lanyard, and a revolver of ·455 bore (to take Government ammunition).

In the Northern Provinces of Nigeria a shot gun with about 500 cartridges (say, 100 No. 2 for geese, 200 No. 3 or 4 for guinea-fowl, &c., and 200 No. 5 for partridges, &c.) will be found almost indispensable if an officer is quartered in the bush. Each 100 cartridges should be soldered in tin. A small bore single shot carbine is good enough for the smaller antelope. For the larger antelope and dangerous game a larger bore is more effective, but so very few opportunities occur of hunting the latter that expensive double-barrel rifles of large bore are seldom used. Officers will, of course, make themselves acquainted with the restrictions imposed by law in regard to the shooting of game.

* Horses can be used in the following Provinces:—Kano, Sokoto, Bornu, Bauchi (Central), Kontagora, Zaria, Yola, part of Nassarawa, Ilorin-Kabba, Muri, and Niger.

MEDICINES, &c.

Bi-hydrochloride of Quinine, 500 tablets of 5 grains each.
Sulphate of Soda, in crystals, 1 lb. weight.
Bottle of Chlorodyne, $\frac{1}{2}$-oz.
Boracic Acid, 2 lbs. weight.
Bi-carbonate of Soda, 2 ozs., in tabloids of grains x. each.
* Clinical Thermometer (to be used only if there is no doctor at the Station).
* 6 First Aid Dressings.
* Alum, for clearing water, 1 lb., in tabloids of grains iii. each.
Permanganate of Potash, $\frac{1}{2}$ lb.
Vaseline, for protecting knives and razors from rust, 1 lb.
Sulphate of Magnesia, 1 lb, in 1 oz. packets.
Large tube of Hazeline cream.

The sulphate of soda is intended for use as an aperient, in doses of one heaped-up teaspoonful. Other aperients may be substituted if preferred. Directions for the use of the rest of the drugs are given in Appendix E and other parts of this book.

Officers likely to be stationed in any place, where a Medical Officer is not available should apply, on the Coast, for a small bottle of the following tabloids :—

Vegetable Laxative.
Lead and Opium Pills.
Compound Phenacetin.

Directions for use to be put on bottle.

* Persons going to the larger towns, and not likely to travel, can omit the articles marked with an asterisk.

PROVISIONS.

It will usually be found cheaper to take out the less perishable kinds of provisions from England rather than to buy them locally. Good fresh provisions when obtainable are much preferable to tinned, but almost every officer will require some of the latter. Except in the cases mentioned in the foot-note on page 42, it is suggested that at least three months' supply of provisions should be taken out, and officers going to bush stations may find it expedient to take out a larger supply. Provisions should be packed in cases with hinged lids and a padlock and key, and not in nailed-up cases. Suitable cases are obtainable ready packed. Some of the cases weigh 60 lbs., but this will not be too heavy for a strong carrier, although 50 lbs. is better.

The following list of articles for one case will serve as a guide to those who prefer to select their own provisions :—

- ½-lb. tin Tea.
- ½-lb. tin Coffee.
- ¼-lb. tin Cocoa.
- 7 small tins "Ideal" or "Green Butterfly" Milk.
- 1 bottle Saxin Tabloids.
- 1 2-lb. tin Rolled Oats.
- 2 ¼-lb. tins Sardines in oil or Tomato Sauce.
- 6 tins assorted Meats.
- 2 1-lb. tins of Marmalade.
- 6 4-oz. tins of Jam.
- 2 ½-lb. tins of Butter.
- 2 1-lb. tins of Plain Biscuits.
- 1 bottle Salt.
- 1 ¼-lb. tin Pepper.
- 1 ¼-lb. tin Mustard.
- 2 boxes Sparklets, if Sparklet Syphon is taken.
- 6 tins assorted Soups or 6 Soup Squares.
- 1 ½-lb. tin Curry Powder.
- 1 2-lb. tin Rice.
- 2 1-lb. tins Beef Dripping.
- 4 tins assorted Vegetables.
- 4 tins Fruit.
- 1 bottle Pickles.
- 1 small bottle Worcestershire Sauce.
- 2 1-lb. tins Tongue.
- 3 tins assorted Tinned Meats or Army Rations.
- 1 bottle Lime Juice.
- 1 Tin-opener.

This will more than suffice for a week even where nothing can be got locally, and ordinarily, where some fresh provisions are obtainable, it will last a good deal longer.

APPENDIX B.

FURNITURE.

The Government of the Gambia provides all European officers with furnished quarters.

In the Gold Coast the following is a list of the articles of furniture usually supplied to single officers :—

DINING ROOM.

Table, Dining	1	Cupboard	1
Sideboard	1	Table, Writing	1
Wagon, Dinner	1	Chairs, Bentwood ...	6
Chair, Bentwood, Arm ...	1		

BED-ROOM.

(NOTE THAT MOSQUITO NETS ARE NOT SUPPLIED.)

Bedstead	1	Pillows	2
Canvas Sit	1	Press	1
Mattress, Wire	1	Table, Dressing	1
Mattress, Hair	1	Toilet Glass	1
Bolster	1	Chairs	2

BATHROOM.

Washstand	1	Towel Horse	1
Toilet Ware (5 pieces)...	1	Bath Tub	1

VERANDAH.

Madeira Couch	1	Madeira Centre Table ...	1
Madeira Lounge	1	Madeira Tea Table ...	1
Madeira Chairs	4	Filter	1
Filter, Stand	1		

LATRINE.

Latrine Pan	1	Latrine Cover	1
Latrine Rim	1	Sand Box	1
Sand Scoop	1		

PANTRY.

Meat Safe 1

KITCHEN.

Stove	1	Water Drum	1
Table	1	Water Bucket	1

In Sierra Leone the furniture provided is much the same as in the Gold Coast. Mosquito nets are not supplied, and the tables and chairs are not so numerous. Stoves are not always included in Sierra Leone ; but they are provided in some up-country stations, and in all bungalows in Freetown and Hill Station. Bath tubs are not provided in Sierra Leone, though baths are in the more modern bungalows.

In Nigeria, simple furniture is provided for permanent quarters. The houses contain lamps, and the cook-houses contain stoves.

Officers have to supply themselves with everything else they may require in their quarters. Only camp furniture is required for " bush quarters."

APPENDIX C.

CIVIL UNIFORM FOR WEST AFRICA.

The following Field Dress has been sanctioned for Administrative and Departmental Officers :—

Khaki (greenish) [or blue]* Norfolk Jacket, of drill, [flannel]* or serge, military pattern with plain brass, leather or Colonial buttons, and without shoulder straps or piping. The collar of the jacket to be either stand-up or rolled. In Nigeria the collar should be turned down to show a tie of olive green, in Sierra Leone a tie of Oxford blue.

Calvin cord or khaki drill knickerbockers or breeches.

Khaki putties or brown leather gaiters (Khaki [or blue]* trousers of similar material to the jacket may be worn in place of knickerbockers or breeches).

Brown leather shooting boots.

Wolseley or pith helmet or sun hat.

Puggarees of the colour chosen by each Colony or Protectorate. (Silk for senior officers; linen for junior officers.)

Khaki cap (optional) of the new military pattern, with band of the colour chosen by each Colony or Protectorate.

Except in Nigeria, a band or braid, of the colour chosen by each Colony or Protectorate, of material 3 inches wide in the case of senior officers, and 1½ inches wide in the

* These alternatives are not admissible in Nigeria.

case of junior officers, to be worn three inches above the bottom of both sleeves.

Special shirts (optional), either white tennis or field service shirts of the latest pattern.

Dinner Dress (optional) for Nigeria only.—White drill shell jacket, white trousers and white canvas boots (thin black serge dinner jacket and trousers and black boots, optional), with black tie and French grey cummerbund.

In the Gambia, the following evening dress is worn by officers when dining at Government House :—

Formal invitations by card :—White mess jackets, 3 small gilt buttons with crown, roll collar, pointed cuffs with 2 small gilt buttons with crown. Black trousers crimson cummerbund, black patent leather Oxford shoes (or dress wellingtons, or mosquito boots of patent leather with soft black leather tops), soft fronted shirt, stiff collar, black tie. Miniature medals.

Informal invitations :—As above, but without miniatures, or dinner jacket suits.

In the Protectorate of Nigeria the use of the field dress is compulsory for all civil servants entitled to wear it. In the four Colonies any civil servant entitled to wear the field dress may do so, and the Governor may order it to be worn by any class or classes of civil servants if he thinks that this would be desirable.

In Sierra Leone the field dress is worn only by officers serving in the Protectorate.

Suggested dinner dress for Sierra Leone :—White duck (or similar material) dinner (not shell) jacket, white trousers to match, blue cummerbund or white waistcoat, soft-fronted shirt, black evening shoes, stiff collar, black evening tie.

The following are the distinctive colours of the several Colonies and Protectorates :—

Gambia	...	Crimson.
Sierra Leone	...	Oxford Blue.
Gold Coast	...	Old Gold.
Nigeria	...	Olive Green.

The above uniform, which is peculiar to West Africa, does not take the place of the civil uniform prescribed by H.M. the King for the service of the Crown throughout the Empire, which is worn by Governors, the Heads of the principal Departments, Provincial Commissioners, and certain other senior officers, upon suitable occasions.

Officers of the Civil Police Forces will wear Police uniform in lieu of the above uniform, and officers of the Nigeria Marine Department, the Marine uniform.

APPENDIX D.

COOKING RECIPES.

To make Bread.—(1) If there is no cooking range it is necessary to make an oven. A good oven can be made by taking clay and erecting on a slab of clay a hollow dome of clay like a bee-hive; the clay arch can be supported by first taking a few twigs and bending them into half circles and planting both ends in the ground, one on each side of the slab of clay that is to form the floor.

A gap is left at one side to put the bread in, and a small hole is left at the top so as to allow the fire inside to burn.

When ready, the fire is drawn and the dough is placed in the hot oven, the hole at the top is closed and the gap also closed by a piece of tin, the tin being covered over with clay.

The walls of an oven so made should be about three inches thick.

(2) To make a medium-size loaf, take 1½ lbs. of flour and mix it with half a pint of palm wine that has been collected about ten hours before; let the dough thus made stand in a warm place for an hour, then mix it with half a pound more flour and let it stand again for about 15 minutes before placing it in the oven.

Baking powder and water can be used instead of palm wine. Good flour should bind when compressed in the hand, and bread made from it should gain about 30 per cent. in weight.

In boiling a joint the meat should be plunged into boiling water for five minutes to harden the outside and to retain all extractives, &c., in the interior; the rest of the

cooking should be carried out at a lower temperature, *i.e.*, the joint should be allowed to simmer. Give a quarter of an hour for each pound weight and a quarter of an hour over. Some salt should be put in the water. The scum which will rise to the surface of the water should be removed.

To make broth the process is reversed; the meat is cut in fine pieces, and put in cold water and very slowly brought up to the boil, so that all the "goodness" can dissolve out into the water and form broth. The meat must then simmer for some time, till it is in "rags."

In roasting a joint allow a quarter of an hour for each pound weight. Begin by putting the joint very near a hot fire for a few minutes, and complete the cooking further away. Baste frequently.

To stew meat cut up each pound of beef into about a dozen pieces, put in a saucepan with a teaspoonful of salt, add a sliced middle-size onion and a quarter of a pint of water per lb. of beef; put on the fire for 10 minutes until a thin gravy is formed; add one ounce of flour per lb. of beef, stir for a few minutes, add about three-quarters of a pint of water per lb. of beef; let the whole simmer until the meat is soft. The flour must be well mixed with cold water before it is put in.

Chickens can be roasted or boiled. They may also be cut up into four pieces, each piece being beaten soft with a stick and then fried as a chop; or without beating, the pieces can be stewed and served with white sauce.

Or a chicken can be spatch-cocked, *i.e.*, cut straight down the back, turned flat and fried. Or it can have all the bones and flesh removed from the skin, the flesh scraped from the bones and chopped up, mixed with onions, pepper, &c., and replaced in the skin and then roasted.

Natives have many other methods of serving chickens.

Mutton soup. Half a pound of mutton should make a pint. Cut the meat into pieces, add two ounces of

vegetables, half a teaspoonful of salt, a little pepper, half tablespoonful of rice or barley and let it simmer for two hours; skim off the fat which rises. A similar soup can be made from goat's meat.

Plum pudding, one pound of flour, 1½ lb. of Valencia raisins, ¾ lb. of lard, two tablespoonfuls of sugar, and sufficient water to make a rather stiff paste. Eggs should be put in when they can be had, and suet, if obtainable, would be better than lard. Mix thoroughly, put in a cloth, tie tightly, and boil for four hours.

To boil rice, put a quarter of a pound of rice, washed, into about 3 pints of boiling water and boil gently for three quarters of an hour; strain off the water and keep the rice near the fire in the pot so that it can dry.

The water can be drunk as rice water; if a lime be squeezed into it and sugar added, a refreshing drink can be made.

Yams and pawpaw are cut into pieces and boiled until soft when felt with a fork.

Plain white sauce for pawpaw, &c., take ½ oz. of butter, ¾ oz. of flour, ¼ pint of milk, pepper, salt, a few drops of lime juice.

Melt the butter in a pan, mix the flour thoroughly with it, add the milk, and cook well, stirring frequently. Finally add the juice of the lime, &c.

The chief **native dishes** are—

Ground nut soup.

Black soup.

Palm oil chop (a liking for this has usually to be acquired).

For cooking purposes nothing answers so well as a "Boilerette," sold by any stores.

There is much of practical value that could, with advantage, be added to this appendix on cooking recipes; but space in this limited booklet does not permit of it. There is a very sound practical book on cooking entitled "Practical West African Cookery," by S. Leith-Ross and G. Ruxton, published by J. W. Moore, East Street, Chichester, and obtainable through any firm that supplies provisions and kit. The authoresses, after many years experience of life in Nigeria, have put their knowledge of local conditions and food products, available in the country, within reach of all those who go to West Africa.

APPENDIX E.

TREATMENT OF DISEASES AND ACCIDENTS.

Officers should, of course, not attempt to treat themselves or others except when the help of a medical man cannot be obtained. The following notes are intended as a guide when no medical assistance can be had.

Malarial Fever.—Chilliness or shivering, with pains in the back and legs, with or without sickness, indicate the necessity of taking the temperature with the thermometer. If, with these symptoms, the temperature is much above 98·4°, the patient is probably suffering from an attack of fever. He should go to bed, take a 10 grain dose of quinine in solution (repeated in four hours if the temperature continues high) and a hot drink, and wrap up well in blankets. This may cut the fever short, but usually the temperature rises to, or is at first found to be, over 103°. If the bowels are not regular one heaped-up teaspoonful of Sulphate of Soda in water should be taken before or after the quinine. Quinine should be taken every four hours until the fever falls, but each dose except the first two should be of five grains only.

A temperature of, say, 99°, if unaccompanied by a feeling of illness, does not necessarily indicate fever, as many people have a slight rise of temperature when quite well. Men should avoid the practice of taking temperature when they have no feeling of illness.

The usual course of the fever is that the patient after lying in bed for a few hours sweats profusely, and his temperature falls to normal, or near it; if this occurs at night he will probably fall asleep. Next morning he had better take ten grains of quinine, and afterwards five grain doses every four hours during the day, if the temperature rises

again. If the temperature does not rise he need not take a second dose after the ten grain dose until evening, when he should take five grains.

On the following days five grains should be taken in the morning and five at night for a week, and thereafter, if there is no more fever, the usual regular dose.

If vomiting is a prominent symptom, take the patient to a doctor. In this case the quinine swallowed may not be absorbed and quinine must be administered by other means.

Where temperature is high, skin remains dry, and headache is troublesome, two tabloids of Compound Phenacetin may be given.

Should the temperature rise to 105° cold sponging must be resorted to. A friend should stop all draughts, have the sick man gently lifted on to a waterproof sheet, keeping his body as horizontal as possible, as he may faint if he sits up, and sponge him all over with cool water, while a boy fans him, until the temperature taken in the lower bowel is 102°. As an alternative the body may be covered with thin towels soaked in cool water, and fanned rapidly, the towels being frequently changed. Water to sponge a patient can be made several degrees cooler by adding to it one or two handfuls of salt. Brandy, vinegar, or Florida water, are valuable additions to the plain water, as they assist evaporation and thus help to lower the temperature. Should the temperature rise afterwards to 104° in the armpit, sponging must again be resorted to. There must be no half measures about cold sponging, as the patient's life is in imminent danger if the temperature does not come down.

Suppose the temperature does not again go above 105° but continues between 103° and 105°, or thereabouts, in spite of his taking five grains of quinine every four hours, he should take fifteen grains of quinine twenty hours after the first two doses of ten grains. If this does not at least reduce the temperature considerably, the patient

should be taken to a doctor when this would be quicker than sending for a doctor to come to the patient.

The diet in malarial fever should consist of broth, milk and water, mashed biscuit, or bread and milk. Rice-water or barley-water may be drank as required.

In grave forms of malarial fever it is absolutely necessary that the quinine, if administered by the mouth, should be taken dissolved in water and not in pill or tablet form.

Yellow Fever.—Should it be known that yellow fever is about, every case of fever, pending the arrival of a medical man, should be regarded with suspicion, the patient placed under a mosquito net, food withheld, absolute rest insisted on, and fluid freely supplied.

Diarrhœa.—Diarrhœa is often due to the eating of something injurious, which it is necessary to remove; it is therefore best to begin treatment with a mild purgative. Half a teaspoonful of sulphate of soda in water will serve the purpose. After the sulphate of soda has acted, chlorodyne in doses of from five to ten drops may be taken three times a day in about two tablespoonfuls of water. If the diarrhœa continues it is best to consult a doctor.

Avoid fruits, highly seasoned or rich dishes, and palm oil chop. Take soups, boiled chicken, milk puddings, eggs, bread and milk, and milk and water. Arrowroot is especially good in diarrhœa.

As precautions against diarrhœa see that all drinking water is filtered and then boiled; see that the filter is kept clean; avoid eating too much unripe or over ripe fruit or indigestible dishes; and prevent chills at night by covering the abdomen with a blanket. If predisposed to diarrhœa wear a cholera belt.

Dysentery.—Dysentery is indicated by the presence of blood and slime in the motions, with diarrhœa and griping, but streaks of blood alone on the stools may be due to piles. Dysentery is always serious, and if there is not a quick recovery it is best to travel to some place where medical treatment can be had.

In the meanwhile it is good treatment to take small doses of sulphate of soda to wash out the poison, a quarter of a teaspoonful every two hours in water. A quarter of a teaspoonful is half what is contained in a teaspoonful only to the edge (not a heaped up teaspoonful). The food must mainly consist of rice-water or milk. Milk and water, milk puddings, rice water, white of eggs beaten up into a froth and then mixed with milk, water and a little sugar, are all useful. Arrowroot may be used. The disease should not be allowed to become chronic.

The precautions against dysentery are the same as those against diarrhœa. All green foods, such as lettuce used as salad, should be thoroughly washed three or four times in boiled water, under personal supervision before being eaten, as a precaution against diarrhœa and dysentery.

Blackwater Fever.—Cases of blackwater fever usually occur only in persons who have previously suffered from several attacks of malarial fever. They are sometimes very serious, and should always be treated with the utmost possible care.

If a man passes dark water (urine) of the colour of stout, and has rigors and a rise of temperature, he is probably suffering from this disease. He should go to bed at once, avoid all draughts and chills, and drink plenty of fluids.

In every case of blackwater fever it is advisable that the help of a medical man should be obtained as soon as possible.

It is undesirable to move a person suffering from blackwater fever, but it may be permissible in the first twenty-four hours of the illness, provided that—

> (*a*) there are considerable advantages to be gained by moving the patient; *e.g.*, a change from circumstances of great discomfort to comparative comfort, or if the patient is very distressed and anxious to be moved, or if the move will result in his being seen by a doctor much sooner than if he stays where he is;

(*b*) the journey can be performed by boat or otherwise without more than a minimum of jolting and shaking, the patient remaining in a recumbent position throughout; or

(*c*) the distance is only a few miles.

The patient's food should be the same as in malarial fever. Milk and water is the best habitual drink during this illness. Abundance of it should be drunk with a view to flushing the kidneys and washing the poison out of the system.

If the temperature rises to 106° cold sponging must be resorted to as in malarial fever. Should vomiting come on and continue, an attempt should be made to inject two tablespoonfuls of milk and half a pint of water every two hours into the lower bowel by means of a syringe.

For the persistent vomiting, which is such a prominent feature of most cases of blackwater fever, the following prescription acts with marked effect :—

3 drops of Tincture of Iodine
3 drops of Pure Carbolic Acid

mixed in a tablespoonful of water and given every time the patient vomits.

The serious conditions which may arise in blackwater fever are :—

1. The blood may get poor and scanty.
2. The temperature may rise too high.
3. The patient may sit up when too weak, and as a result may faint and not recover.
4. The kidneys may get choked with black debris, or inflamed, and so stop secreting water.

For the preceding four conditions the following treatment should be applied :—

1. Plenty of fluids should be drunk.
2. Cold sponging.

GLOSSINA PALPALIS Rob.-Desv.

Enlarged Four Times. The Carrier of Sleeping Sickness.

NOTE THE DARK COLORATION OF THE BODY; ALSO THE CENTRAL PALE PATCH ON THE ABDOMEN, AND THE FIVE BLACK SEGMENTS *(tarsi)* OF THE HINDMOST PAIR OF LEGS. THE ABDOMEN IS MORE ROUNDED THAN IT APPEARS IN THE FIGURE. THE PROBOSCIS IS BENT DOWNWARDS; IT IS THE *palpi* THAT ARE VISIBLE.

3. The patient must keep lying down.
4. Flannels should be wrung out in hot water, covered with a large, dry, warm bath towel and applied to the loins; or (better when possible) an india-rubber bottle of hot water should be applied.
5. Where the officer understands the treatment he should take saline injections in the lower bowel; the injections can be made by dissolving a teaspoonful of salt in a pint of warm water.

To wring out a hot flannel, place the flannel on a towel, put the middle of towel and flannel in a washhand basin, letting the ends of the towel hang outside, pour on hot water, the flannel can then be wrung out by twisting the ends of the towel in opposite ways.

Quinine should not be taken in blackwater fever unless prescribed by a medical officer.

Sleeping Sickness.—This disease, though rare among Europeans, is found in various parts of West Africa. It is caused by the presence in the blood and tissues of a microscopic animal germ known as a "Trypanosome," and is spread from person to person by means of a tsetse fly (*Glossina palpalis:* see diagram). Should this fly bite a person infected with sleeping sickness and suck his blood, it may become infected with some of the Trypanosomes and so become capable of inoculating another person, whom it may bite later on, with the disease.

Care should be taken, therefore, while in the bush, to avoid the bites of this and other varieties of tsetse fly. The flies are easily recognised, being roughly about the size of a "bluebottle" or "blow-fly" and of a brown or brownish-grey colour; their appearance when resting is characteristic, as the wings, instead of lying on the body like the blades of a half-closed pair of scissors as in the common house-fly or "bluebottle," project over the hinder end of the body and are closed one over the other, like the completely-closed blades of a pair of scissors.

Sleeping sickness is to be recognised in its early stages by bouts of fever, which apparently resemble the fever of malaria, but are not cured or controlled by quinine. In such cases the medical officer should be seen as early as possible in order that the blood may be properly examined and suitable treatment given if necessary.

The following notice on this subject has been issued :—

Camps should be chosen away from wooded streams, and netting should be used when journeying in canoes and when sitting down during the day on the march. It is not necessary to have a small mesh—a large coarse net which will admit air freely should be carried, and erected at halting places when trekking. Light coloured clothes are a protection, and a fly switch should be carried.

The following are the main points to be noted :—

1. The disease is practically always transmitted from a sick person to a healthy one by the bite of a tsetse fly.

2. The presence of even a single diseased person in a locality infested by tsetse flies may entail the infection of a whole community.

3. A tsetse fly is able to retain its power of infection for some days, probably up to three weeks at least.

4. There are no authenticated instances of the transmission of the disease from sick persons to healthy ones in districts where the tsetse fly is not found.

5. The tsetse fly is nearly always found in the near neighbourhood of fresh water where the vegetation is luxuriant and shade abundant. It is only found where these conditions exist, and the infested belt is a narrow one.

6. The flies quickly abandon places where, through the clearing of vegetation, the conditions favoured by them are removed.

7. The fly and its pupa are sheltered, not by the large trees with smooth unbranched stems, but by the bushes, brushwood or scrub, and it is this which must be destroyed when measures are being taken to get rid of them.

8. The time of the day when the flies are most numerous is from about 8 a.m. until half-an-hour before sunset. They are more active in still weather—wind drives them to shelter at once. On a windy day not one may be seen at a place where in still weather they abound. They are seldom seen at night.

Indigestion.—Indigestion may often be relieved by taking in two tablespoonfuls of water as much bicarbonate of soda as can be heaped up on a shilling, three times a day, about a quarter of an hour before meals. Indigestion may be due to quinine taken in tabloid form; if the tabloid be dissolved, and taken in solution half an hour after a good meal, the symptoms of indigestion are found to improve.

Jiggers.—Jiggers are most plentiful in sandy places.

When a jigger is boring into the skin a sensation of tickling is felt, and an intelligent native should be asked to remove the jigger.

He must first wash his hands thoroughly with soap and water, then rinse them with boracic solution. (Directions for making boracic solution are given at the end of this section). The European meanwhile should rub some boracic solution over the place where the jigger is and prepare a stout needle by passing the point two or three times through the flame of a match or candle. He should wash off any black that may be on the needle with boracic solution and then let the native pick out the jigger with the needle. If the native is given plenty of time the operation will be almost painless.

A small piece of cotton wool or lint soaked in boracic solution should be placed over the place from which the jigger has been removed.

Do not neglect jiggers or you may give yourself much needless suffering.

Tumbo Fly.—A very troublesome and painful boil is caused by this fly depositing a maggot under the skin. It can be distinguished from an ordinary boil by a peculiar intermittent pricking feeling which is caused by the maggot wriggling. On looking at the apex in the swelling the head can be seen moving gently. This complaint is alarming but is not serious, and the maggot can be expelled by squeezing or, better still, by pulling it out with a fine pair of forceps. The small circular opening which is left should then be dressed with boracic lotion or carbolic ointment.

Prickly Heat.—Use carbolic soap daily in the bath. After drying yourself, rub all over with fresh undiluted lime juice and allow to dry on the skin. The underclothing should be changed and washed frequently. Cut down the amount of liquid consumed, and, as far as possible, avoid perspiring.

Slight Wounds.—Small cuts should be washed with cold water which has been boiled, then well sprinkled with boracic acid powder and covered with a first aid dressing or a piece of rag which has been boiled and dried in the sun.

Wounds which bleed profusely should have a piece of gauze from a first aid dressing or a portion of boiled rag pressed against them tightly enough to control the bleeding, and should subsequently be dressed like smaller cuts.

Bites of Poisonous Snakes.—Tie immediately a handkerchief twisted into a rope round the limb *above* the wound, and make the handkerchief grip the limb tightly by passing a piece of stick between the two and twisting the stick round. Keep it so by securing the stick to the limb. Make several cuts where the fangs went in, removing the actual fang marks. Wash the part well with strong Condy's fluid, or rub in crystals of permanganate of potash, or, failing these, use warm boracic solution. Finally loosen the handkerchief and dress as usual for small wounds.

Poisoned Arrow.—If the wound is in a limb, tie a handkerchief as for snake bite. Incise the wound and syringe it out with warm boracic solution and use the syringe to suck out liquids from the bottom of wound. Tannic acid, in powder if available, should be applied to the wound.

Broken Limbs.—If a limb is believed to have been broken it should have two sticks gently tied to it, one on each side, so as to fix the joints above and below. The injured man should not be moved until this has been done. The seriousness of a fracture is much increased if, by rough handling, the bones are caused to penetrate the skin.

To make Boracic Solution.—Put a heaped-up teaspoonful of boracic acid powder into a half-pint tumbler and add four teaspoonfuls of warm water, mix well, then fill the tumbler with warm water—water which has boiled and has cooled somewhat. The solution is then ready for use. It can be used either hot or cold.

RAINFALL (INCHES).

		Jan.	Feb.	Mar.	April.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Bathurst, Gambia ...	1913	0·13	0	0	0	0	2·23	3·00	10·69	6·08	1·55	0	0	23·68
Freetown, Sierra Leone	,,	0·02	0	0	0·13	6·44	14·99	31·84	36·22	24·36	6·38	2·22	0·88	124·48
Accra, Gold Coast* ...	,,	0	6·26	1·24	2·43	4·75	4·23	5·28	1·73	0	2·04	1·22	0	29·18
Lagos (Nigeria)	,,	0	2·98	1·05	2·95	7·91	16·87	15·57	2·48	5·40	4·72	0·61	0·11	60·65
Calabar (Nigeria)	,,	0	2·71	3·23	8·19	14·17	9·00	28·15	21·35	14·86	13·49	9·53	4·16	128·84
Zungeru (Nigeria)	,,	0	0	0	0	1·59	2·85	7·94	10·39	6·65	1·28	0	0	30·70
Bathurst, Gambia ...	1919	0	0	0	0	0·14	2·62	7·44	18·16	9·77	1·10	0	0	39·23

* The Gold Coast west of Accra and inland parts of the Colony have a heavier rainfall.

TEMPERATURE OF THE AIR IN THE SHADE.

			Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Bathurst ...	1913	Highest	100	98	100	104	93	98	94	91	95	94	98	95
		Lowest	59	60	60	60	60	67	68	69	67	69	66	64
Accra ...	,,	Highest	88	87	89	88	87	83	85	83	89	86	78	86
		Lowest	75	75	74	78	65	70	75	74	74	73	75	71
Lagos ...	,,	Highest	91	92	97	92	90	89	87	86	87	91	99	99
		Lowest	72	71	71	72	72	71	71	70	70	69	72	68
Calabar ...	,,	Highest	94	94	92	94	94	94	92	91	91	92	94	90
		Lowest	70	70	74	74	70	72	72	72	72	72	74	72
Zungeru ...	,,	Highest	100	102	105	106	100	99	92	91	93	95	97	99
		Lowest	56	60	65	67	69	69	66	65	66	65	58	59
Freetown ...	,,	Highest	91	90	91	92	91	90	86	86	86	87	89	88
		Lowest	74	74	74	76	73	72	70	68	70	70	71	70
Bathurst ...	1919	Highest	90	100	100	100	94	95	90	91	95	93	94	93
		Lowest	65	65	66	65	68	70	72	68	66	66	73	66

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